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Energy Systems of Ukraine: Characteristics, Dependence and Influence on Economic and Political Self-Determination

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The purpose of this thesis is to conduct an analysis of the current composition of Ukrainian energy systems, analyze its dependence on Russian energy sources, explore alternatives to diversify the supply of fuel resources, and offer insights on the best possible solution for Ukraine. Currently, a substantial part of energy in Ukraine is produced with gas and oil supplied from Russia. A monopoly supplier might cause significant dependence of the domestic economy upon a foreign country. This might give the supplier country an opportunity to control and dictate. The Russian President and much of the political leadership did not support the most recent political developments in Ukraine (e.g., Presidential elections, "Orange Revolution"). Ukraine's political goals include development of closer cooperation with the EU, U.S. and NATO. This would not match Russian foreign policy interests towards former Soviet Republics. Economic influence by Russia could be used to influence Ukrainian foreign policy. The goals of this thesis are to show that the search for alternative sources of energy for Ukraine is a very important aspect for economic and political independence, and also to identify alternatives for the development of the Ukrainian energy market.

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ENERGY SYSTEMS OF UKRAINE: CHARACTERISTICS, DEPENDENCE AND INFLUENCE ON ECONOMIC AND POLITICAL SELF-DETERMINATION

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ENERGY SYSTEMS OF UKRAINE: CHARACTERISTICS, DEPENDENCE AND INFLUENCE ON ECONOMIC AND POLITICAL SELF-DETERMINATION

ABSTRACT

The purpose of this thesis is to conduct an analysis of the current composition of Ukrainian energy systems, analyze its dependence on Russian energy sources, explore alternatives to diversify the supply of fuel resources (oil, gas, nuclear fuel), and offer insights on the best future possible solution for Ukraine. Currently, a substantial part of energy in Ukraine is produced with gas and oil supplied from Russia. Oil and gas strategic reserves are not enough to withstand possible long-term fluctuations in supply. So, fluctuations either in volume or price of supplied gas and oil can influence economic conditions. A monopoly supplier might cause significant dependence of the domestic economy upon a foreign country. This might give the supplier country an opportunity to control and dictate.

The Russian President and much of the political leadership did not support the most recent political developments in Ukraine (e.g., Presidential elections, "Orange Revolution. Ukraine's political goals include development of closer cooperation with the EU, U.S. and NATO. This would not match Russian foreign policy interests toward former Soviet Republics. Economic influence by Russia could be used to influence Ukrainian foreign policy.

The goals of this thesis are to show that the search for alternative sources of energy for Ukraine is a very important aspect for economic and political independence, and identify alternatives for the development of the Ukrainian energy market.

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I. INTRODUCTION

In the modern world, the significance of energy sources to vital human functions grows constantly. The development of energy industries is not only part of economic development - it becomes its integral condition. Economic development and energy resources are interrelated in the same way as demand and proposition is in a market economy. Economic development determines energy demand, and availability of energy quantity (and quality) determines the rate of economic growth. The significance of energy for economic development can be presented by the fact that industrialized countries, with about one quarter of the world's population, account for some three-quarters of the global energy consumption today.[1] Therefore, the availability of energy resources for one particular country can significantly influence its economical development; it causes dependence on energy resources for the country's economy. Countries with natural energy reserves are in an advantageous position compared to countries without such resources. Interrelations among them might place less secured countries into economic dependence on energy resources of more advanced countries. This thesis will analyze the situation when one particular country – Ukraine - depends on foreign energy sources. Moreover, primary energy sources, such as oil, natural gas and nuclear fuel, are mostly supplied by a single country–(i.e., Russia), which makes it a monopoly supplier.

The hypothesis of this thesis is that Ukraine depends on Russian energy resources, and that this dependence is used by Russia as an economic leverage in bilateral relations. Ukrainian oil and gas reserves are not enough to withstand possible long-term fluctuations in supply. So, fluctuations either in volume or price of supplied gas and oil can affect economic conditions in general. Also, changes in nuclear fuel supply can cause a collapse of uninterrupted processes on nuclear power plants, which would bring large material losses. Using such dependence, a monopoly energy supplier is able to influence the economy of a dependent country. The economic advantage makes it capable to dictate terms of economic interrelations.

[1] World Energy Council. 2004

However, economic dictatorship and control can be used not only in economic cooperation, but also for achieving political goals. Thus, this thesis presents the historical examples of Russia-Ukraine relations when economic leverages were used for political pressure in order to bring Ukraine to the terms of Russian policy.

The Russian President and much of the political leadership did not support the results of the most recent political developments in Ukraine (e.g., the Presidential elections and the "Orange Revolution"). The new Ukrainian government is politically independent and eager to provide new state domestic and foreign policies directed to the development of a free market economy and cooperation with the Western countries, EU, and NATO. Those newest political goals would not match the interests of Russian foreign policy towards former Soviet Republics. Although Russia does not have political instruments for influencing Ukrainian domestic and foreign policies, it is capable of strong economic interference in the Ukrainian energy market. If Ukraine desires to be fully independent in its political self-determination, it should find a way to eliminate or decrease Russian economic influence. In this perspective, the search for alternative sources of energy might be very important for Ukraine's economic and political independence.

The objective of this thesis is to conduct an analysis of the current composition of Ukrainian energy systems, identify dependence on Russia by energy sources and its influence on political self-determination, explore the available alternatives for the Ukrainian energy market development, and offer insights on the best possible solution for Ukraine.

Analysis of the given problem will be conducted with the help of presented data and by deductive reasoning. None of the expected conclusions and propositions should be interpreted as derived from the official terms of cooperation between Ukraine and Russia.

II. GENERAL STRUCTURE AND COMPOSITION OF ENERGY SYSTEMS OF UKRAINE

Ukraine is an important segment of the world's energy market. It is a critical transit center for energy resources between Europe, Russia, and Asia. Ukraine is also one of the largest countries in Europe, and a significant energy producer and consumer in the regional economy.

The Ukraine's energy systems can be generally divided onto four parts: oil production, consumption, and oil transit; natural gas production, consumption, and gas transit; coal mining industry; and electricity production and consumption. The Ministry of Fuel and Energy of Ukraine exercises the overall control in all areas of the energy industry.

A. CHARACTERISTICS OF OIL PRODUCTION, CONSUMPTION, AND OIL TRANSIT

1. Oil Production and Consumption[2]

The Ukraine has 395 million barrels of proven oil reserves. Most reserves are spread through central and eastern regions with the majority located in the Eastern Dnieper-Donetsk basin. Although Ukraine has made efforts at oil exploration, particularly in its sector of the Azov Sea, oil production has remained relatively constant since Ukraine obtained its independence in 1992. However, consumption has fallen dramatically, from 813,000 barrels per day in 1992 to around 415,000 barrels per day in 2004. Despite consumption declines, the Ukraine is still highly dependent on imported oil. For example, in 2003, net crude oil imports totaled roughly 350,000 barrels per day, representing about 80% of consumption. There are two main oil suppliers – Russia and Kazakhstan. Most of the oil comes from Russia – about 96 percent of all imported oil, and lesser amounts from Kazakhstan – about 4 percent.

Ukraine has six crude oil refineries with the joint capacity of about 1 million barrels per day. This capacity could cover domestic demand for oil products three times over. However, refineries do not work in full capacity. During the 1990s they did not

[2] Numeric data presented in this section derived from the official website of Ukrainian State Company "Naftogas Ukrayny".

receive enough crude oil to satisfy even Ukraine's domestic petroleum product demand. This situation became better in the last few years, when Ukraine started to offer oil exporters in Russia and Kazakhstan limited ownership in Ukrainian refineries. Recent success in the process of privatization of its refineries gave Ukraine the opportunity to increase oil supply to meet domestic demand and bring in the capital for investing in renovations.

2. Oil Traffic and Oil Transit[3]

The unique geographic location of Ukraine makes it an ideal corridor for oil transit from Russia and the Caspian Sea region countries to the European market. There are more than 2,800 miles of oil pipe lines in Ukraine, combined in three major pipelines nets: "Prydniprovsky oil-trunk pipe-lines", "Oil-trunk pipe-line "Druzhba", and oil pipe-line "Odessa-Brody." All the pipeline nets are controlled by the company "Ukrtansnafta", which belongs entirely to the state. The main tasks of "Ukrtransnafta" are to deliver crude oil to Ukraine's oil refineries and to transit crude oil from Russia and Kazakhstan to European and global markets.

As oil transit from the Caspian Sea region towards Europe is expected to increase over the next several years, Ukraine hopes to become the transit center for this oil stream. For that purpose, the pipeline "Odessa-Brody" and Black Sea marine terminal "Pivdenniy" were completed in 2001, which connected the Black Sea port Odessa with the city of Brody. "Odessa-Brody" was initially designed to load Caspian oil from terminal "Pivdenniy" and then carry it through the Ukrainian system to Europe. Expected capacity of this complex is about 300,000 barrels per day. However, "Odessa-Brody" has been inactive for approximately three years because Ukraine was unable to secure oil supplies from Caspian Sea area suppliers. Russian companies exploited this situation and proposed to use the pipeline in the reverse direction - to transport oil from Russia southwards to tankers in the Black Sea and then to world markets. Since January 2003, Russian oil companies have used part of the "Odessa-Brody" pipeline for these purposes - called "reverse".

[3] Numeric data presented in this section derived from Ministry of fuel and energy of Ukraine official website

During 2003-2004, the Ukrainian government has pledged several times that the "Odessa-Brody" pipeline would be used only for its original purpose, but was nevertheless still using it for "reverse" transit. This became an issue between countries of the European Union, Ukraine, and Russia.

B. CHARACTERISTICS OF NATURAL GAS PRODUCTION, CONSUMPTION, AND GAS TRANSIT

1. Natural Gas Production and Consumption[4]

Ukraine has 39.6 trillion cubic feet of natural gas reserves and six gas-refining plants. Average annual production from reserves is about 0.69 trillion cubic feet. At the same time, average annual consumption of natural gas is around 3 trillion cubic feet, which places Ukraine in the sixth position in the world. Therefore, roughly 2.3 trillion cubic feet of gas Ukraine needs to be purchased from foreign suppliers. There are two countries that supply gas for Ukraine: Russia and Turkmenistan. Initially, Russia was the major contributor to the gas market of Ukraine, supplying gas partly as a payment for gas transit through Ukraine to Europe and partly as a sale under annual contracts. For the last several years, Turkmenistan has become the larger source of gas imports on the basis of long-terms agreements. Currently, Ukraine buys 40 percent of internally consumed gas from this country, and the present agreement on supply is effective through the period of 2002 through 2006. Additionally, the governments of both countries have announced an initiative to make the next period much longer - 2007through 2032.

2. Natural Gas Transit to Europe[5]

Ukraine plays an important role as a major transit country for European and world natural gas markets. Through its territory flows about 75 percent of Russian gas exported to European and other countries. One-third of the amount of European gas consumption transits through Ukraine's territory. The combined length of Ukrainian gas pipelines is about 23.2 thousand miles.

The current technical condition of the Ukrainian gas pipeline network is becoming a growing concern to Russian gas producers, Ukrainian gas transporters, and

4Numeric data presented in this section derived from the official website of the Ukrainian State Company "Gas Ukrayny".

5 Numeric data presented in this section derived from the official website of the Ministry of fuel and energy of Ukraine.

European gas consumers. Some of the pipes will be worn out in the near future. There are pipes that have been working 20-30 years without major repair due to lack of available funds. Also, full capacity utilization is a problem. System capacity allows transporting 20-25 percent more than it does in fact. In order to upgrade and manage the pipeline network more completely, the heads of three states – Ukraine, Russia, and Germany – agreed in June 2002 to establish the Consortium for the Management and Development of the Gas Transport Network. Next year, a new company will created by agreement between Naftohas Ukrainy and Gazprom (e.g., Russian state-owned oil and gas company), with each holding a 50 percent stake. German's Ruhrgas has been invited to participate as a consulting partner. Representatives from other countries of Europe and the Caspian Sea basin have voiced interest in the consortium: Gaz de France, European Bank for Reconstruction and Development, Turkmenistan, Azerbaijan, and Kazakhstan. In March 2004, parties of the consortium announced their decision to construct a new gas pipeline connecting the eastern Ukrainian city of Uzgorod with the city of Novopolsk on the Ukrainian-Slovakian border. The expected capacity of the new segment is 1 trillion cubic feet per year, which will increase the Russian gas flow to Europe by 25 percent. Construction plans give it two years to complete the project. It is interesting that the Ukraine guaranteed a zero tax on gas flow through its territory until the investors, Russian Gazprom and Naftohas Ukrainy, recover their investments.

C. CHARACTERISTICS OF THE COAL MINING INDUSTRY[6]

Ukraine has 37.6 billion short tons in proven reserves. Production and consumption of coal in Ukraine has been relatively constant for the last 8 years. Despite having sizeable coal resources, Ukraine, unfortunately, cannot satisfy domestic demand for coal. Average production constitutes little more than 80 million short tons of hard and brown coal. At the same time, consumption exceeds production by about 7 million tons yearly, which makes Ukraine a net importer.

Most of Ukraine's coal reserves are located in the eastern parts of the country - in the Donetsk and Donbass regions. Until recently, the coal mining industry was completely state-owned and had been managed by the vertical structure of numerous state

[6] Numeric data presented in this section derived from Ministry of fuel and energy of Ukraine official website

organizations under the Ministry of Fuel and Energy. Ineffective management caused a number of problems: hazardous working conditions, low productivity and inefficiency, as well as labor strikes. Since 1991, the industry has suffered 700 underground fires and accidents, with 3,500 people dead.

The government of Ukraine realizes that restructuring of the coal mining industry has become a task of first priority. For a long period of time, government heavily subsidized the coal industry, and about half of all mines operated at a loss. In 2002, the Ministry of Fuel and Energy announced the intentions to privatize part of the mines, especially the most inefficient. However, privatization is proceeding slowly due to unattractive conditions of the coalmines for sale. Foreign investors have also supported restructuring of the industry. For period of seven years, beginning in 1997, the World Bank has provided over $300 million in aid. A considerable part of money was spent to close unprofitable mines. At the same time, the government of Ukraine is not enthusiastic about the associated job losses, especially in the regions with few other job opportunities.

D. ELECTRICITY PRODUCTION AND CONSUMPTION IN UKRAINE[7]

Ukraine's installed electricity capacity is 54 gigawatts, twelfth largest in the world. Since obtaining independence in 1991, production and consumption of electricity generally decreased. However, since 2000, it has increased consistently. Currently, this is the only energy industry where Ukraine is the net exporter. Existing capacity allows Ukraine to generate electricity more than twice its needs. However, the distribution system is in poor condition and needs upgrade and improved maintenance, as a significant amount of generated power is wasted during its transfer.

Ukrainian electricity is produced by three types of power plants: thermal plants using fuel (oil, gas, and coal), nuclear plants, and hydroelectric stations. Nuclear plants produce nearly 50 percent of generation, while thermal and hydroelectric plants produce 40 and 10 percent, respectively.

Ukraine currently has four operating nuclear power plants with combined capacity of 12.8 gigawatts, equivalent to about 24 percent of total capacity. All nuclear fuel is

[7] Numeric data presented in this section derived from Ministry of fuel and energy of Ukraine official website

supplied by Russia. Nuclear wastes are also processed in Russia. After the operational problem at the notorious Chernobyl power plant, the government resumed construction of two new reactors at the Khmelnitsky and Rivne power plants. Those projects were begun during the Soviet era and then suspended due to lack of financial resources. The intention to renew construction has been criticized because of existing sufficient electricity capacity and the high price of the project. However, a decision has been made in favor of resuming the construction.

The government tightly controls the electricity market. Since 1997, there has been a central market for wholesale electricity. Power producers sell the energy to the common market operated by "Energorynok" (a division of state enterprise "Ukrenergo"), and 27 regional distribution companies resell to the end users. In 2003, plans to privatize 27 regional electricity distribution companies were announced, in order to bring the efficiency of distribution to a desirable level. Currently, six are fully privatized.

There are several problems that retard the development of the electrical power market in Ukraine. Apart from huge transmission losses, there are some worries about the privatization process. The government has been reluctant to give more than a minority share in the privatized companies, which has slowed down the process. Also, there were worries that the state budget will not receive enough compensation because of unfair and sometimes corrupt sales.

E. SIGNIFICANCE OF THE RUSSIAN PORTION IN IMPORTED ENERGY

As can be seen, every division of Ukraine's energy systems uses imports in varying degrees. The coal mining industry has good potential relative to internal demand, but currently 10 percent of the coal consumed is imported. Natural gas consumption is 25 percent internally produced and 75 imported. The oil production and refinery industry is the most dependable on imported sources, as 80 percent of oil consumed is foreign supplied. All of the fuel for nuclear power plants is also imported. In this section this thesis will analyze how significant the Russian portion is in energy supplied to Ukraine.

As a former part of the Soviet Union, Ukraine was supplied with oil and gas in significant proportions by a centralized supply system. If the data presented in Table 1 is compared, it can be seen that Ukrainian domestic oil production has been constantly decreasing, starting from 1985. Oil consumption, however, was increasing until 1991. After that point, where Ukraine became dependent, consumption has decreased.

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Oil production (million tons)	7,6	6,4	5,9	5,5	5,3	5,2	4,9	4,8	4,4	4,2	4,0
Oil consumption (million tons)	55,7	60,8	63,9	65,6	66,3	68,4	67,1	57,3	32,6	19,4	13,7

Table 1. Oil production and consumption in Ukraine[8]

Similar dynamics is seen in the gas industry. The data in Table 2 presents developments in natural gas production and consumption in Ukraine over the 1985-1995 decade.

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Gas production (billion cubic meters)	47,2	46,8	44,2	38,0	36,5	32,9	24,4	22,2	20,1	18,0	18,2
Gas consumption (billion cubic meters)	88,0	91,7	94,4	103,5	111,8	115,2	117,1	93,5	89,3	86,7	80,5

Table 2. Natural gas production and consumption in Ukraine[9]

Again, after 1991, when Ukraine obtained independence, gas consumption was decreasing constantly. Before that, though, it was increasing despite declining levels of production. This shows us that Ukraine was dependent on external energy sources during the time of the Soviet Union. As Russia was the largest gas and oil producer in the Union, it is appropriate to surmise that the majority of energy supplied to Ukraine came from Russia.

If the structure of imports of oil, coal, nuclear fuel, and even natural gas to Ukraine today is analyzed, one can see how significant Russia's supply to the Ukraine's

[8] Perevezenzev, Naftochimichna I gazova promyslovist of Ukraine. Donetsk, 1998, DIOKON

[9] Perevezenzev, Naftochimichna I gazova promyslovist of Ukraine. Donetsk, 1998, DIOKON

energy is. All of imported coal comes from Russia, which is 10 percent of national coal consumption. About 96 percent of imported oil is supplied from Russia, which is about 77 percent of oil consumption. The Ukraine's nuclear sector is 100 percent supplied with Russian fuel rods for its nuclear power plants. Also, Russia does all of the reprocessing of Ukrainian nuclear waste.

There is a very interesting situation with natural gas supply to Ukraine. The largest current supplier of gas to the Ukraine is Turkmenistan, the second largest natural gas producer in the former Soviet Union after Russia. By 2007, Turkmenistan's annual exports are expected to reach 3,530 billion cubic feet.[10] About 40 percent of the gas consumed in the Ukraine comes from Turkmenistan. Russia still supplies a significant portion of gas to Ukraine's economy, about 35 percent; but this comes as a payment for gas transit to Europe through Ukrainian territory. At first glance, the possibility that Russia would be able to influence the Ukrainian gas market is not so obvious, because Russia is supposedly committed to supplying gas to the Ukraine, and Turkmenistan seems to be the larger player in this situation. However, Turkmenistan and Russia are closely interdependent in this matter. Although Turkmenistan has huge natural gas reserves with relatively lower cost of extraction, it does not play a leading role in setting regional gas price. Russia has a significant role in gas redistribution in the region and, so, has some control of gas pricing. Although Russia itself buys natural gas from Turkmenistan, it uses that gas mostly for redistribution among former Soviet Republics through its own pipeline systems. Turkmenistan is heavily dependent on Russia because it does not have its own gas transportation infrastructure.

There is also Uzbekistan, who sells gas at even cheaper prices than Turkmenistan. Russia also buys gas from Uzbekistan. Having control over redistribution of gas in the region, Russia can manipulate price formation in order to influence gas markets. For example, in December 2004, Turkmenistan raised the gas prices for Russia and the Ukraine, blaming increased production costs and higher costs of gas extraction equipment. After both countries ignored this announcement, Turkmenistan turned off supplies to them on December 31, 2004. Ukraine did not have much choice but to agree

[10] U.S. Government. Energy Statistics Administration

to the higher price. Russia, in its turn, refused to buy Turkmenistan gas, thus reducing the Turkmen gas exports by 247 billion cubic feet for 2005.[11] Russia could meet its gas needs on its own. Moreover, there were some political rumors that Russia provoked Turkmenistan to raise prices in order to "punish" the Ukraine for the "Orange Revolution" that took place one month before.

The meaning of that "punishment" was that Russia could influence the Ukraine without any direct confrontations, and react to Ukrainian political developments. Of course, this was not an official position of Ukrainian authorities. Moreover, it is mostly erroneous, because Turkmenistan would never do such a thing, even under Russian political pressure, as it would not be in the interest of Turkmenistan. However, this idea shows us how Russia might influence the natural gas market in this region.

Also, Russia has a plan to construct a new pipeline for gas transportation to the European community trough the Baltic Sea, which would avoid the territories of transit countries. If this plan is realized, then the Ukraine will lose its transit country privileges for Russian gas, and probably be compelled to buy gas for cash. Having such a huge advantage from possession of energy sources and influence on energy price formation, as well as supplying the greatest part of energy resources for the Ukraine's economy, Russia can possibly exercise significant control of deliveries of coal, natural gas, nuclear rods, and oil to Ukraine.

On several occasions, Russia has tried to demonstrate this capability in the gas and petroleum industries. One such example took place in 1993, when Russia was still the Ukraine's largest gas supplier. One week prior to the Crimea summit between Presidents El'tsin and Kravchuk, the Russian state gas company, Gazprom, reduced gas supply to Ukraine by 25 percent. The official reason was the Ukrainian debt for gas. During summit talks, Ukrainian delegation was warned of the possibility of Russia stopping its gas supply completely in the event of disagreement with Russian summit proposals. In 1995, Russia pressed the Ukraine to join a custom union with Russia, Belarus, and Kazakhstan. Russia imposed unrealistically high prices on gas and oil and threatened the Ukraine with supply cutoffs until it joined the union.

[11] *Korrespondent*, February 11, 2005

The most obvious case is the oil industry. Having complete domination of Ukrainian petroleum imports, Russia can substantially influence the Ukrainian oil industry through changes in crude oil supplies. Thus, during the first two months of 2000, Russia drastically reduced oil supplies to Ukraine. This oil blockade was officially justified by Ukraine's large debts, and to protest the unregulated, illegal cutting of Russia's gas pipeline through the Ukraine. At the time, oil supplies were about 70 percent below its previous level. The result was a significant reduction in electricity production. Regions scheduled electricity cutoffs for several hours a day over 3 months. The economic effect was painful.

III. WHY MIGHT RUSSIA USE ITS ECONOMIC ADVANTAGES TO INFLUENCE UKRAINIAN ECONOMIC OR POLITICAL DEVELOPMENTS?

In the previous chapter it has been demonstrated that there is a theoretical possibility of Russia's influence on Ukrainian economic development and even political self-determination through its monopolized supply of energy to the Ukraine. However, such a possibility might not mean that it would necessarily be exercised. What then might be the motivations for Russia to be interested in asserting influence over Ukraine? In this chapter three major areas in which Russia would be interested in to exploit its advantage will be presented: increasing influence and economic power in the region, enhancement of the Russian geopolitical situation and frontiers by increased control over front line states, and reducing U.S. and NATO influence in the region and the preventing of NATO enlargement.

A. INCREASING RUSSIA'S POLITICAL INFLUENCE AND ECONOMIC POWER IN THE REGION

After the disintegration of the Soviet Union, Russia announced itself as the successor of the collapsed state. Immediately after that, Russia started to assert its absolute leadership, consolidating all former Soviet Republics under its patronage. The creation of the Commonwealth of Independent States was initially an attempt to reunite states on the basis of sovereign equality. Though, it would now be the equal alliance between countries that are so unequal in terms of economic development and political interests. In fact, this organization was an attempt to revive the Soviet system, when all members were equal with a "more equal" Russia. There are many examples of Russia's leading and dictating policy toward CIS members: multiple interventions in internal political processes, such as support of preferred candidates during Presidential elections, and using economic leverage in relationships with CIS members, such as with Ukraine and Moldova. The next step in consolidation of states, on the basis of equality in economic interaction, is the creation of a Common Economic Space. This economic union was not a result of a direct dictate by Russia, but it was the result of its strong policy for associating former Soviet Republics back into a Russian community. The obvious benefits of the Common Economic Space for member states were as follows:

eliminating some tariffs and customs regulations, as well as canceling export limitations between members. In this case, Russia's interest is not in directly dictating economic rules and directions (which is not possible), but close consolidation of CIS countries in order to limit economic interaction with countries of the European Union or the Middle East. However, political developments of the last two years show that perhaps Russia is no longer unconditionally the political leader. Revolutionary events in Georgia, Ukraine, and Kyrgyzstan did not match the plans and interests of Russia.

Moreover, at the beginning of year 2005, Ukraine stated that the CIS had completed its mission and was no longer essential. Then, during the First Integration Forum of the Common Economic Space, the Ukraine announced its possible withdrawal. "Unfortunately, the CIS has proved ineffective. And all heads of state recognized that during the latest informal summit," said Ukrainian Foreign Minister, Borys Tarasyuk, during the May 11th press conference in Kyiv.[12] This can be interpreted as a sign of the redistribution of political and economic power in the region. It would then be illogical to assume Russia would voluntarily give up leadership in this region. Quite the contrary, a logical continuation would be use of all economical and political means to maintain such a position.

What means are available? The members of the Commonwealth of Independent States have become more and more politically independent. New generations of political leadership and developing political consciousness among people has changed the situation drastically. It is no longer possible to talk only about the political influence of Russia. Basically, it would be right to say that Russia is not now capable of full political control over the CIS. However, it is still capable of enormous economic influence, and this is really effective leverage to maintain a leading position.

This analysis leads to a simple conclusion: Ukraine's economic dependence on Russia's energy recourses might be used to achieve Russian interests of maintaining and increasing economic and political power in the region.

[12] InterFax news Agency. May 11, 2005.

B. ENHANCEMENT OF RUSSIA'S GEOPOLITICAL SITUATION AND FRONTIERS BY INCREASED CONTROL OVER FRONT LINE STATES

The intention to maintain and increase Russian political influence and economic power in the region is in pursuit of another goal – the enhancement of the country's borders. The former Soviet Union military doctrine implied the necessity of a large buffer zone between itself and the western world. At the time, this role was played by the so-called Countries of the Socialist Camp. It is obvious that Russia, as the successor of the Soviet Union, would adopt such a doctrine and try to build a buffer zone between itself and Europe and the Middle East. Russia is surrounded and separated from Western and Middle East countries by the former Soviet Republics. Those countries are now viewed by Russia as a new buffer zone, so critical for its national security. Loss of influence over this zone would mean decreased national security. If not controlled, countries of the CIS might turn to the West and develop relationships with traditional rivals of Russia – developed European countries and NATO members. If, for example, Ukraine joins the European Union, Russia will become the immediate neighbor of its opponent.

Although Russia looks at the countries of CIS as Russia's near abroad or some kind of buffer zone, the Ukraine does not share this point of view and acts as a sovereign state. Thus, there is a loss of political control by Russia over the Ukraine. As was discussed earlier, there are no really effective political leverages against Ukraine, but there are still sizable economic means that Russia can use in advancing its interests in its relationship with the Ukraine.

C. REDUCING U.S. AND NATO INFLUENCE IN THE REGION AND PREVENTING THE NATO ENLARGEMENT

Although the Cold War and inimical relationships between Russia and U.S./NATO are no longer present, modern Russia and U.S./NATO are still political rivals. Increased economic and political influence by the U.S. and NATO over the world inevitably decreases Russia's power further. It is therefore in Russia's interest to prevent US/NATO expansion of influence to the former Soviet Union. Russia, however, cannot do much to stop the U.S. or NATO from achieving their objectives. Politically and militarily, US/NATO and Russia are not enemies, and they even have mutual understandings for the global anti-terrorist war. So there is no way for Russia to blame U.S./NATO for direct confrontations from their expansions. This means that Russia

cannot prevent the increasing influence of U.S./NATO on countries near Russia, if it were wanted. At the same time, Russia understands that NATO will never accept new members who are in close relationships with Russia, as this would give Russia the ability to influence internal NATO political processes. Also, a country that is in alliance with Russia or is dependent on Russia will never become a full ally with the U.S. for the same reasons, and Russia is most likely right in those estimations. Therefore, to keep the bordering countries, including Ukraine, in close relationships and, even better, in political or economic dependence, is a good way to prevent them from joining NATO or having close relations with the U.S. Russia has successfully used this tactic for the last decade. The most expressive example of this tactic in relations with Ukraine is joint use of the Ukrainian Black Sea port of Sevastopol for the Russian Black Sea Fleet station.

IV. WHY RUSSIA HAS NOT EXERCISED ITS HUGE POTENTIAL INFLUENCE YET

One might question the significance and capabilities of Russia's role in the economic development of Ukraine. The question might be: "Why does Russia have such a huge potential for influence, but has yet to exercise it? Or, if Russia did try, why was their success limited?" In this chapter it will be shown why Russia, having potential to establish some control over the Ukraine, did not realize it in such an extensive degree as it could have. This author's opinion is that Russia's attitude toward Ukraine (post 1991) and relations with them can be divided into two phases. The first period of 3 to 4 years is characterized by a lack of Russian policy. During this period, Russia simply did not realize the necessity of exercising influence over the Ukraine. The second phase started after about four years of independence, and continued to the present. It is Russia's attempt to make up for lost time. This phase consists of Russia's trials and errors in establishing influence over the Ukraine. However, Russia was not able to restore its weakened political power, and, more crucial, Russia could not effectively use its economic potential to restore its political influence. To do that, Russia would have to exercise all its economic strengths directly and forcefully. In turn, this would mean a break in political relations between two countries and possibly a political confrontation.

Evidence of Russia's failure in the area of political and economic influence on Ukraine would be the defeat of Russia's policy in the Presidential elections and the "Orange Revolution" in December 2004. Those developments showed there were significant shortcomings in Russia's strategy toward the Ukraine. Although Russian authorities, at high levels, have always pronounced their concern about the Russia-Ukraine relationship, Russia has not been able to formulate a consistent strategy. This lack of convergence between theory and practice is probably the most paradoxical aspect of the history of Ukraine-Russia relations after independence.

For both historical and cultural reasons, the Russian people did not take Ukrainian independence very seriously. Initially, nobody in Russia was really thinking about the Ukraine as a separate state. Between late 1991 and early 1993 nothing really changed.

Ukraine was treated as part of some state formation with Russia at the center. The creation of the Commonwealth of Independent States has only strengthened this opinion.

The government of Russia has also failed to act accordingly. Since Ukraine obtained independence, there has been no articulated political strategy towards Ukraine as an independent state. Policy makers did not internalize the independence of the Ukraine. It was even less accepted than the independence of other former Soviet Republics. Even when the term "independence" was used, it had been accompanied by a relatively strong conviction that this was all temporary. Mistakenly, there simply was perceived no need to develop policy towards the Ukraine. According to Russian weekly correspondent S.Tikhii, Ukraine was estimated as a "young sister" who "might return back at any moment."[13] Even in 1994, 43 percent of respondents in Russia's cross-country poll about Ukraine's independence did not regard Ukraine as a sovereign country![14] Evidence about Russia's "special treatment" to Ukraine would include the systematic and open involvement of Russian politicians in the Ukraine's internal politics. For example, during the Presidential campaign in 1994, Russian President B. Yeltsin spoke on public television, supporting acting President Kuchma's election for the next term. There have been several allegations made by the opposition that President Kuchma enjoyed financial support by Russia. Russia, of course, pursued its own interests in keeping Kuchma's cabinet in office. Personal relations between Kuchma and Yeltsin guaranteed Ukraine's cooperation, and Kuchma's opponents were more antagonistic to Russia.

On the other hand, it might be that providing any policy towards an independent Ukraine could accentuate its actual independence more than Russia wanted. Even much later, in February 2000, a poll of the Russian political and economic elite showed that 31 percent of the respondents did not recognize Ukrainians as a separate ethnic group, and instead considered them as "Russians living in Ukraine."[15] Such a situation was highly satisfactory for Russia, as it kept the Ukrainian issue in a desirable context.

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[13] S.Tikhii. "Kiev tozhe slezam ne verit", Moskowskie novosti, March 1995.

[14] FOM: public opinion foundation, Russia, 1994.

[15] V.Chaly, M.Pashkov. "Ukraine's International image: the view from Russia" *National Security and Defense*, 2000, 3.

As can be seen, Russia did not initially exercise its economic advantage to influence Ukrainian economic and political developments, due to an underestimation of the political necessity of doing such a thing.

However, an independent Ukraine was already a fact and relations between Russia and Ukraine inevitably led to the establishment and development of the legal base for country-to-country relations. Moreover, the Ukraine did not share Moscow's vision of Russia-Ukraine cooperation, and treated those relations like relations with any other country. This could bring the level of interaction between the two countries into more diplomatic-centered modes, versus local cooperation. Reality compelled Russia to transform its attitude to the Ukraine from very familiar to more official. This was the point when the Russian political elite realized that Ukraine had become an independent member of the world community, not a "younger sister" of a "big brother". The necessity to work out an articulated policy toward the Ukraine has brought into question what to do with the Ukraine in order not to lose the former degree of influence. Of course, Moscow's official position towards Ukraine did not change for the worse, as good-neighbor relations were still predominant. At the same time, although the bilateral affairs were at a qualitatively new level, the diplomatic dialog was still held in the context of the imperial seniority of Russia and implied negligibility of Ukrainian interests. All attempts by the Ukraine to promote its own views were controlled by Russia, either in direct negotiations or through the Commonwealth of Independent States. In other words, having realized that something should be done in order to keep Ukraine under control, Russia mistakenly tried to exercise its political leadership.

Russia's political attempts to influence Ukrainian policy for economic and political self-determination significantly worsened political relations between the two countries. As Russia increased its efforts to seize the initiative in the bilateral dialog and dictate the conditions of cooperation, Ukraine increased its desire to demonstrate independence. This did not improve the relationship between the two and made the split bigger. Paradoxically, it was not in Russia's interests, as it made influencing the Ukraine even more difficult.

Russia then needed to restore its position at least to the level enjoyed after the creation of the Commonwealth of Independent States. There were two ways to act in order to make the Ukraine more attentive to Russia: recognize de facto or partly recognize Ukraine's independence and turn the dialog to a more amicable subject, or use compulsion to turn Ukraine back to respect and obedience. If the Russian political authorities chose the first, it would mean that Ukraine would obtain real independence and Russia would have to admit a "political capitulation". Influence on Ukraine in this case would decline greatly, and control would not be a possibility. This would not match Russia's political interests regarding the former Soviet Republic. The second variant is more in accord with Russia's interests and goals, as it would return Russia to a position of power and leadership. However, there were limited points of leverage available. As discussed earlier, there were no more political tools to compel Ukraine's obedience, as Ukraine did not want to accept Russia's patronage. The only way Russia could pursue its ambitions in bilateral affairs was to use the Ukraine's economic dependence on Russia, as a monopoly source of energy.

It would then seem very simple to predict political developments in the region. The only thing Russia would have to do is use its economic advantage over the Ukraine in order to dictate terms, and, of course, the main leverage in this matter would be energy – primarily the oil and gas supplies. Predicting this, dialog seems simple: if Ukraine does not agree with the political position of Russia, then Russia stops its loyalty towards Ukraine in the area of oil and gas supply, which means decreasing amounts of oil and gas or increasing prices. As described earlier in chapter II, those schemes were applied by Russia in different times, in different situations, with different goals.

Those attempts to use economic power to influence political developments were partly successful. For example, in the case of 1993 Ukraine-Russia Presidential talks, or the 1995 creation of a common custom union between Russia, Belarus, Kazakhstan, and Ukraine. However, the Ukraine is still not fully under Russian economic influence. Although there is no doubt that certain economic dependence is still a useful tool in Russian policy towards Ukraine, it is not as effective as Russia desires. It could not influence Ukrainian political behavior, for example, to limit cooperation with the West. The reason for that is Russia, having a huge oil production capacity, has only limited

capacity of transporting oil to buyers. As long as the Ukraine remains on the way between Russia and Europe and Asia, the major part of Russian exported oil and gas will continue to go through Ukraine.[16] There is no way for Russia to fully use oil or gas as bargaining leverage, because it affects oil flow to other European countries and creates difficulties in trade relationships between Russia and Western countries. In some cases, the Ukraine managed to withstand Russian oil blockades with the help of counter measures such as transit output and transit prices.

Another important reason why Russia is having problems using oil blockades against Ukraine is the growth of Russian and Ukrainian business and political elites. As both Ukraine and Russia chose a market economy versus a planned economy, businesses in both countries have been growing constantly during the last five years. Close connections have been developed between businesses in both countries. This is especially true for the energy sector. For example, the three largest Ukrainian oil-refinery plants are owned or partly owned by Russian companies. This is politically significant, because most tycoons are very close to the political institutes of their countries. They lobby for their own interests and create connections with the same establishments abroad. The main inducement for these connections is economic rather than political. Businessmen are not always interested in the political issues of their governments, as they only care about their goals, which are to do business and make money. Russian businessmen are then rather reluctant to follow Russian foreign policy interest in their relations with Ukrainian businesses because of risk to business prospects. Thus, the December 1999 to February 2000 oil blockade showed that the use of such sanctions causes serious internal political debates, generated probably by the business elite. All these considerations make it harder for Russia to use its economic advantage to influence the Ukraine.

As can be seen, Russia has not yet been able to use its huge economic potential in order to keep the leading position in relations with the Ukraine. At first, Russia lost the political lead due to lack of strategy towards the Ukraine as an independent state, and second, Russia did not effectively manage its economic power. If Russia were more far-sighted and gave more attention to the Ukraine issue, it would have combined political

[16] U.S. Government. Energy Statistics Administration, and the official website of the Ministry of fuel and energy of Ukraine.

cooperation and economical leverage in order to keep the Ukraine under its influence from the time of independence until the present.

V. UKRAINE'S ALTERNATIVES IN THE DEVELOPMENT OF ITS ENERGY MARKET AND THE DECREASE OF RUSSIAN INFLUENCE

In previous chapters Russia's advantage over the Ukraine in terms of the supply of energy sources was described and reasons why Russia did not use it in order to achieve political goals were discussed. In this section, the current political Russia-Ukraine relationship will be examined, and the possibility of further Russian attempts to exercise its economic power over the Ukraine and necessity to find new alternatives to Russian energy will be analyzed. Ukraine's prospects for energy market development, as well as the political and economic role of the West, will also be analyzed. There are three major alternatives for energy market development: continuation of oil, gas, and nuclear fuel imports from Russia, further exploration of own natural reserves, and diversification of suppliers.

A. SHOULD THE UKRAINE FIND ALTERNATIVES TO RUSSIAN ENERGY SUPPLIES?

Despite recent changes, Russia still plays a very important, if not decisive, role in the Ukrainian economic system. The most crucial area is, of course, energy sources - oil and gas supplies in particular. Although Russia was not able to use this economic advantage over the last decade, it does not mean that Ukraine's political self-determination is safe from Russian infringement. The Presidential elections at the end of 2004 showed that Russia has not given up its desire to influence Ukraine's internal politics. The Russian President and political establishment provided open support for one of the candidates, expressed in a politically inappropriate manner. The Russian President personally visited the Ukraine twice in order to demonstrate his backing for the V. Yanukovych campaign. Also, several Russian Duma members and the mayor of Moscow visited Ukraine with the same message.[17] The reason for such close support was evident, as it was to prevent the election of V. Yushchenko, whose program did not match Russian goals. Partly because of this support, pro-Russian candidate V. Yanukovych was able to win the first round and pretended to win the elections. Moreover, when the

[17] Peter Biles. BBC, 1 December, 2004.

election results were called in to question and the political situation in the country was close to civil disorder, Russia sent a special forces squad onto Ukrainian soil to protect the former President L. Kuchma and his political ally V. Yanukovych, in case of an anti-government revolt. Russia officially denied this, although there was considerable evidence to refute Russia's denial.[18] The situation was finally resolved peacefully, and, under the pressure of a national-wide strike, re-voting was ordered by the Supreme Court. The final result was not in favor of the pro-Russian candidate, as V. Yushchenko won. This situation brought new circumstances into Ukrainian-Russian relations.

First, Russia's involvement in the election process turned out to be the most significant mistake of Russian strategy towards the Ukraine. Indeed, it was politically shortsighted to provide full support for an unpopular candidate and put all political influence at risk. Moreover, this mistake is seen now not only as a result of incorrect policy toward Ukraine, but as a general example of incorrect Russian policy toward all former Soviet Republics. As a result, Russia's regional political prestige suffered a great deal.

Second, this put both countries on the outs. Russia viewed V. Yushchenko as its political enemy during the election, the reason being that the ultimately successful candidate had a different policy towards Russia and pro-Westernism. After so much criticism of V. Yushchenko by Russian politicians, it was much harder to start a friendly dialog after his election. Although the first Ukraine-Russia Presidential meetings were considered generally successful, the political situation is different now, and this difference is not in Russia's favor. Its political domination of the Ukraine has virtually disappeared.

In order to gain revenge and restore its political power and reputation among states of the CIS, Russia needs to regain the initiative. The most effective way to do that would be to demonstrate economic power over Ukraine, and place it back in the position of being dependent. Ukraine is therefore facing a choice between two general options – to continue importing Russian energy at the same degree, or to diversify suppliers.

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[18] GlobalSecurity.org. "Russia & the Presidential Election".

If there were guarantees that Russia would not again try to use its monopoly position to affect Ukrainian internal affairs, the Ukraine would not need to look for alternatives to Russian oil, gas, and nuclear reactor fuel. However, the history of Ukraine-Russia relations demonstrates that there are no guaranties. Ukraine is compelled to protect itself from Russia's economic pressure, and the best way to do so is to obtain economic independence. This does not necessarily mean that the Ukraine should not import Russian energy supplies, as that is almost impossible, since Russia has the largest natural reserves in the region. What it really means is that Ukraine should eliminate the Russian monopoly and create a more flexible supply system.

B. WHAT ARE THE UKRAINIAN ALTERNATIVES TO RUSSIAN SUPPLIES?

In order to eliminate the Russian monopoly on energy supply, the internal Ukrainian potential and the regional energy market needs to be analyzed, and the available alternatives then need to be determined. There are two major directions from which non-Russian oil and gas might come to the Ukraine: the Caspian Sea region and the Asian countries of OPEC.

Geographically, Ukraine has transport systems connecting the transportation infrastructures of Europe, Asia, Russia, and the countries of the Caspian Sea basin. The Ukraine connects sea-lanes to pipelines and railways. This location advantage might be enhanced through further development of transportation systems. To do this, Ukraine would need to develop cooperation with both energy producers and energy consumers. In connecting both sides, Ukraine would have an advantageous position in seeking energy imports.

Considering the tough competition in the energy and transportation industries, Ukraine might not be able to quickly achieve the goal of a strong position in oil and gas transportations between countries of Asia and Europe. Therefore, several different alternatives could be developed and implemented simultaneously. Simply buying from the countries of the Caspian Sea basin or OPEC would be another option.

Nuclear energy alternatives could also focus on diversification. Finding alternatives to Russia's nuclear fuel supply and reprocessing of wastes (with the help of other nuclear powers) could be the right solution.

Further exploration of internal reserves is of no small importance. Although Ukraine is not a country with huge natural reserves, its proven stocks of oil, gas, and especially coal are sufficient for internal demand if they can be fully developed.

All the prospects for energy market development are mostly for the long run, and require a consistent, patient strategy. Ukrainian authorities should consider simultaneous development of all possible measures for energy diversification.

1. Caspian Sea Region Reserves[19]

The Caspian region contains a huge amount of untapped natural reserves of gas and oil. The region's total oil reserves may reach 60 to 200 billion barrels. This would be enough to satisfy Europe's demand for more than a decade. Natural gas reserves of the region are estimated at 232 to 236 trillion cubic feet, which is comparable to Saudi Arabia. Much of these reserves are located in the Caspian Sea on the territories of Azerbaijan, Uzbekistan, Turkmenistan, and Kazakhstan. Due to underdevelopment of regional capacities and distance from major manufacturers of continental shelf drilling equipment, oil production remains very low. In 1995, for example, the region produced only 870,000 barrels per day.

However, the major problem is Ukraine's geographical and political isolation. Geographical isolation is due to natural obstacles, such as seas on the west, and mountains on the south and the east. North of this region is Russia. Almost all of the existing pipelines built during the Soviet era are directed to the north or west, where Russia controls connecting lines. There is a low-capacity connection to the east or south.

The political situation does not favor the development of the region. It is surrounded by countries that are politically unstable or under sanctions (e.g. Afghanistan, Iran, and Iraq). Moreover, each of the countries in the Caucasus and Central Asia themselves face difficult political challenges. They are all transitional countries and politically unstable. Caspian regional pipeline infrastructures are vulnerable to regional conflicts. Numerous ethnic and religious groups inhabit the Caspian Sea region, and continuing conflicts pose threats to pipelines, including those under construction. The

[19] Numeric data presented in this section is derived from U.S. Government Energy Statistics Administration.

Azerbaijan-Armenia war over the Armenian-populated Nagorno-Karabakh enclave in Azerbaijan has yet to be resolved. Separatist conflicts in Abkhazia, South Ossetia, and Ajaria in Georgia flared in mid-1990, and the Abkhazia conflict has escalated to the international level. Another feature of the regional instability is Russia's war with Chechnya, which has devastated the region around Groznyy in southern Russia. The September 2004 terrorist act in Beslan demonstrated the strained political situation in the Caspian Sea region.

Political isolation is increased by Russian policy towards former Soviet Republics. As stated earlier, Russia is not interested in the development of relations of any kind between near-Russia and other countries. Also, as Russia is a country of the Caspian Sea basin, it is interested in exploration of Caspian natural reserves only within its own territory. With the control over pipelines coming from the region to the West, Russia would not be willing to give access for oil to western markets. Additionally, the capacity of the pipelines would not be enough to transport all of the available oil. There is no easy way for oil and gas to leave the Caspian region. Therefore, if increased exports are desired, new routes must be created.

There are several available oil development projects to be considered. One of them is the Caspian Pipeline Consortium (PCP) project that consists of a 1000-mile pipeline connecting the Tengiz oil field in Kazakhstan to the Russian Black Sea port of Novorossiysk. Construction began in 1999 and was mostly completed in 2001. The PCP was fully operational in 2003, and in 2004, had already reached a capacity of 22.5 million tons a year. The crude oil is transported from Novorossiysk to Mediterranean and world markets through the Bosporus. This project was the largest single investment in the Caspian region by U.S. petroleum companies, including ChevronTexaco and ExxonMobil.

The other project is likewise partially connected to Novorossiysk and sponsored by the Azerbaijan International Operating Company, a consortium of ten foreign oil companies, including four American companies (Unocal, ExxonMobil, Amoco, and Pennzoil). There are two lines developed by this project. One line crosses the North Caucasus to Novorossiysk and the other goes from Azerbaijan to the Georgian port of

Sup'sa. The crude oil is then transported through Bosporus to the world market. During the first half of 2004, the Azerbaijan International Operating Company exported about 36 million barrels of oil.

A third oil transportation project takes oil from Azerbaijan to the world market. The construction of the 1,040-mile pipeline form Baku to the Turkish Mediterranean port of Ceyhan, via Georgia, is scheduled to be completed and operational in the summer of 2005. This route is called the "Main Export Pipeline". One of the distinguishing features of this project is that oil will bypass the increasingly crowded Bosporus Strait and go directly to the Mediterranean (at Ceyhan). This project has faced numerous challenges. At the beginning, the pipeline was regarded as technically infeasible because of its extended distance through rugged terrain. Now the project developers face criticism from non-governmental organizations for being environmentally hazardous, threatening archeological treasures and violating human rights.

Although gas reserves in the Caspian Sea are greater than oil, companies and governments of this region have shown more interest in oil export development. This is due to lack of existing infrastructure for gas operations and great capital expenditures needed for gas pipeline construction. There is only one new major gas project of significance for the regional market, and its known as the South Caucasus Pipeline. This gas pipeline (from Baku, Azerbaijan to Erzurum, Turkey, through Tbilisi, Georgia) will run parallel to the Baku-Tbilisi-Ceyhan oil pipeline for most of its length before connecting to the Turkish gas line infrastructure near the town of Erzurum. Estimated initial capacity of this pipe is 1.5 billion cubic feet per day. The pipeline is planned to be expanded to 3 billion cubic feet per day in 2007, and is scheduled for exports to Turkey in August 2006.

As is evident, exploration and exploitation of Caspian Sea natural reserves are not yet fully developed. Further increases in production and export of oil and gas from this region will require new transportation infrastructure. Most likely, the future means of carrying oil and gas will be new pipelines from the Caspian Sea to the Russian and Georgian Black Sea ports. These seem to be more preferred than construction of south-directed pipelines because of less technical challenges and capital expenditures. Also, the

western direction appears to be more secure. Russia is more capable of securing pipelines than its Caspian neighbors. Georgia, after its democratic reforms and establishment of a new government, became more politically stable. There are then several ways for further transit, such as to Black Sea ports across the sea in Turkey, Bulgaria, Romania, and Ukraine, or to the Mediterranean through Turkey's Bosporus and Dardanelles Straits. However, the seaway from the Black Sea to the Mediterranean is of growing concern. The government of Turkey and numerous non-governmental organizations have voiced concerns about the ecological situation around the Black and Marmora Seas. Highly increased sea transport traffic through the Bosporus Strait increases the possibility of pollution, especially with more petroleum tankers. Turkey has already announced its intention to limit operations in this crucially important transport node. With these increased security measures, the exploitation of the straits is becoming slower and more costly. Thus, the Black Sea outlet is becoming limited for sea transportation, and port-to-port connections within the Black Sea boundaries gain in importance. Four Black Sea ports connect seaways to pipelines. They are: Turkish Kliyikoy, Bulgarian Burgas, Romanian Constantia, and Ukrainian Odessa.

A proposal to build a pipeline that would be an alternative to Turkish straits was communicated to Turkey by Russia. A consortium known as the Thrace Development initially put this idea forward. The connection between the Black Sea port of Kliyikoy and the Aegean Sea port of Ibricbaba would bypass the Bosporus and Dardanelles Straits with a capacity of 1 million barrels per day. An alternative to this project proposal is a 1-million-bbl/d line from the Black Sea port of Samsun in northeastern Turkey to Ceyhan. However, Turkey might not be interested in the construction of bypasses. The reason is that the Turkish Straits serve mostly as a transportation channel for countries of the Black Sea basin other than Turkey itself, and because Turkey has enough connections between the Black Sea and the Mediterranean over land.

The proposed Bulgaria-Macedonia-Albania oil pipeline project would have 570 miles of pipes and a capacity of 750 thousand barrels per day. It would start from the Bulgarian port of Burgas and lead to the Albanian Adriatic port of Vlore. Although proposed since 1994, it is still not operational. Pipeline backers cite several reasons for this: problems with countries committing because of the Macedonian name, a continuing

wait for a clear connection to the Caspian Sea region, and the poor condition of all three refineries in Albania (two are closed, and the third is barely functional).

Another Russian proposal in 1997 was to construct a much shorter pipeline connecting the port of Burgas and the Greek Aegean Sea port of Alexandropoulos. This 178-mile underground pipeline would allow Russia to export oil via the Black Sea, while bypassing the Bosporus Strait, with a capacity of 300 thousand barrels per day. However, a wide range of technical and economic issues has slowed the project. Although Russia, Greece, and Bulgaria signed a memorandum of general agreement in November 2004, they did not complete a memorandum of understanding by the end of the year as was planned. The reason was partly Russia's support of the Bulgaria-Macedonia-Albania oil pipeline. Greece initiated further negotiations for construction of the pipeline in early 2005, with the final signing of a memorandum of understanding expected in summer 2005. Arguments about the necessity for both the Bugas-Vlore and Burgas-Alexandroupolis pipelines may result in a construction of only one of them.

Another pipeline project, known as the Constantia-Omisalj-Trieste Pipeline or South-East European Line, would connect the Romanian Black Sea Port of Constantia with Italy's Adriatic port city of Trieste. Proposed by Romania, it would extend across Romania to the Serbian town of Pancevo (near Belgrade), where it will connect to an existing branch of the Adria pipeline that runs across Serbia and Montenegro, Bosnia and Herzegovina to Trieste. Although a previous planned proposed that the pipeline would end at the Croatian Adriatic port of Omisalj, Croatia initiated a revision for the route due to environmental concerns. Countries along the route plan to incorporate existing connections between Constantia and regional refineries, which will enable them to use the pipeline. In November 2004, the governments of Romania, Serbia-Montenegro, Croatia, Slovenia, Italy, and Austria agreed to endorse the South-East European Line and its connection with the Transalpine pipeline. Transalpine supplies refineries in Austria, Germany and the Czech Republic. Construction is scheduled to start in late 2005, with a capacity of 480 thousand barrels per day by 2007.

2. The Role of the Odessa-Brody Pipeline

With all the positive features of projects listed so far, there is one very important condition, and that is they are all still projects and not operational yet. In this regard,

Ukraine has an advantageous position with the Odessa-Brody pipeline and oil terminal "Yuznuy" ("South") connecting the Ukrainian Black Sea port of Odessa with the city of Brody. Exploitation of this pipeline would serve several purposes simultaneously: reducing the amount of oil transported by tankers through the Turkish Straits; acquiring oil from countries of the Caspian region; reducing Ukrainian dependence on Russian oil; and developing economic relationships with countries of Central and Western Europe. Unfortunately, since the completion of the first part of the pipeline in 2001, there have been numerous controversies about how to use it.

Initially, the new oil pipeline was intended as a means for the transit of Caspian oil to Europe. Oil transported from the ports of Georgia and Russia were supposed to be stored in the oil terminal "Yuznuy", near the port of Odessa, and then pumped towards the Ukrainian–Polish border, going through Brody where the pipeline "Druzba" ("Friendship") intersects. Then, Caspian oil would go in one of two directions, to Hungary and Slovakia via "Druzba", or to Polish border city of Plotsk (with a further link to the Baltic port of Gdansk) via the Odessa-Brody pipeline (expanded to the northwest). After the completion of the first pipeline segment between Odessa and Brody in 2001, with the capacity at 180 thousand barrels per day,[20] the Ukraine was unable to obtain a sufficient amount of oil from Caspian suppliers to operate the pipeline profitably. As a result, it was inactive until 2004. During the Kuchma regime, there were several talks with the governments of Kazakhstan and Azerbaijan about oil supplies for the Odessa-Brody pipeline. However, the Ukraine could not offer financial incentives attractive enough for the Kazakh and Azeri side.

There are two possible explanations for this that might be considered. The first is a purely economical reason, as the parties might have discovered insufficient profitability. Although there were no calculations published, the existence of such calculations is possible. The refusal to supply crude oil to the Ukrainian pipeline might be based on the difference in profit that Azerbaijan or Kazakhstan might get from the transportation through Ukraine and profit they already receive from supplies to the Russian Black Sea port of Novorossiysk. However, this explanation contradicts common

[20] Ukrainian State Company "Naftogas Ukrayny".

sense, as oil transported through pipelines from the Black Sea to European countries should obviously be cheaper than oil transported by tankers through the Turkish Straits, and then through the Adriatic, to European countries. Attempts to describe Odessa-Brody as unprofitable might rather be a result of another reason – political.

It is obvious that the Kuchma regime was not interested in exploiting the pipeline in its original direction, but was more interested to reach an agreement with Russia. Russia opposed the use of Ukrainian assets for transit of Caspian oil. Russian oil companies proposed to use Odessa-Brody in a reverse direction (from Brody to Odessa) in order to transport Russian oil through the Black sea to world markets. Russia's interests in the proposal are obvious, as it would increase Russian oil outflow; and at the same time, the Ukraine would still depend on Russian oil, instead of having a Caspian supply. Also, the Odessa-Brody pipeline, carrying Caspian oil to Europe and the Baltic Sea through Poland, is a rival to Russia's oil, and would decrease dependence on Russian oil for this region. In this context, Russia will do everything possible to prevent completion of further parts of the pipeline and use of the existing part in a westerly direction. Thus, there is clear Russian influence on the Azerbaijani position in this matter. Initially interested in cooperation, the President of the Azerbaijani State Oil Company SOCAR stated in May 2004: "Azerbaijan will not participate in this project and we do not plan to join the project in the future."[21] The official reason for this was mentioned as participation in another oil pipeline project known as Baku-Tbilisi-Ceyhan.

The official Ukrainian position on the purpose of the Odessa-Brody pipeline has vacillated over the last four years. Initially, there were no other possible uses for Odessa-Brody other than the west direction. The main talks with the Kazakh side were held with participation of ChevronTexaco, which has a significant share in Kazakh oil production as well as the capability of transporting oil to the Black Sea. In April 2004, the Ukrainian government confirmed its desire to use the pipeline in the original direction. On April 17, Deputy Prime Minister for fuel and energy A. Klyuyev agreed with Kazakh Prime Minister D. Akhemot to supply Kazakh oil to refineries in Ukraine and to use Ukrainian's transport capacity to export to Europe.

[21] Washington Times. 29 June 2004

The expected amount of oil pumped through Odessa-Brody was to be 2 million tons a year. However, this agreement has ceased because nothing was done by the Ukrainian side to fulfill it. As was known later, A. Klyuyev with Chairman of Naftogas Ukrainy, O.Boyko, and the head of Ukrtransnafta, S. Vasilenko, were the strongest supporters of V. Yanukovych during the Presidential campaign. Then, as the Ukrainian Presidential campaign started, the offer from Russia made more sense to the ruling regime of Kuchma. On July 5, 2004, the government removed the legal limits on transporting oil through the Odessa-Brody pipeline exclusively in one direction. A bit later, on July 26-27, "Ukrtransnafta" announced that it accepted an offer from Russian-British consortium TNK-BP to ship oil from Brody south to Odessa and then by tankers to seaways.[22] Moreover, according to the agreement, if the Ukrainian side decided to stop this transit and redirect it, it would have to repay the credits. Later reports confirmed that the amount of oil transited through Odessa did not correspond to the planned output of 180 thousand barrels per day. During 2004, only half of the expected amount was transported. This would make the Odessa-Brody pipeline unprofitable for Russia. However, Russia continued to use it in 2005, with an announced plan to pump through only 90 thousand barrels per day, which is half of the original promise. Therefore, this pipeline is highly expensive and unprofitable for Russia. The fact that Russia still uses it is evidence of Russian interest in keeping this line busy with reverse oil flow.

After the new President of Ukraine, V. Yushchenko, came into office, the new administration indicated a preference for the Odessa-Brody pipeline to be used in the west direction. About a month later, the new Prime Minister, Y. Tymoshenko, claimed that reverse exploitation of Odessa-Brody was unprofitable and unfavorable for Ukraine, and that the government would quickly resolve this problem. At the same time, during his visit to Moscow in January 2005, President Yushchenko stated that the pipeline would temporarily continue to operate in reverse mode.[23] However, he clarified, that this decision had become inevitable last year, for lack of direct access to Caspian oil. Although it is contrary to the initial purpose of the pipeline, it seems to be reasonable for now, since Ukraine is still bound by the previous agreement, and oil inflow from the

[22] Jamestown Foundation. *Eurasia Daily Monitor*. Volume 1, Issue 64. August 2004.

[23] Jamestown Foundation. *Eurasia Daily Monitor*. Volume 2, Issue 17.January 2005

Caspian Sea is not established. Two days later, President Yushchenko visited Poland, where a preliminary agreement was reached in regards to the pipeline extension to Plotsk in Poland. Since then, the Ukrainian position seems to be consistent in its intention to use the pipeline for delivery of oil to Europe from the East when the extension to Poland is completed.

European businesses voiced their interests in the Odessa-Brody extension and exploitation in a western direction. Thus, the European Investment Bank announced its potential willingness to help in project financing. The European Bank of Reconstruction and Development has also offered its assistance in the pipeline extension into Poland and even to Germany, to utilize the connection at Brody with "Druzba" to Central Europe. After the Prime Ministers of Ukraine and Georgia announced together a joint agreement to use Odessa-Brody in the west direction, the project took on greater meaning. It was now a plan to use Georgian Black Sea ports for oil transport to Odessa.

Those last developments concerning pipeline Odessa-Brody show that the Ukrainian government seriously considers, for the first time, taking real measures directed at weakening Ukrainian dependence on Russia for crude oil. If the Ukrainian government follows a consistent policy and is able to finish the project of Caspian oil transit to the Ukraine and then to Europe, the alignment of economic and political forces in the region will change. For Ukraine, this will mean a decrease of Russian political influence.

3. The Countries of OPEC

Another alternative energy source for the Ukraine is the nearest countries of OPEC. Buying oil and gas from the Middle East is not a new idea. Since independence, the Ukraine sought contacts with Iran, Libya, and Iraq for supplies and transportation of oil and gas. After 2003, war started, and Iraq was no longer viewed as a potential partner. However, relationships between the Ukraine and Iran and Libya are still developing.

The first practical results were reached in 2001, when Ukrainian Foreign Minister A. Zlenko visited Iran with a proposal to construct a gas pipeline to transport natural gas from Iran to Western Europe through the Ukraine. At the time, a general agreement was reached and one meeting was conducted later, but no action has ever been taken. After

the 2004 Presidential elections, the new Ukrainian government stated that negotiations with Iran would be intensified. In March 2005, the third meeting of the two countries' energy commissions was held in Kiev. During this meeting, the Ukrainian Deputy Minister of Energy announced the Ukraine's intention to buy 15 million cubic meters of gas annually from Iran if the pipeline is built. The proposed routes for the future line are either Iran-Armenia-Georgia-Black Sea-Ukraine or Iran-Armenia-Georgia-Russia-Ukraine. As a next step, a meeting of experts is scheduled to be held in Tehran in May 2005 to discuss financing. The two countries will then make the final decision. The Ukraine has also expressed its desire to take part in Iranian oil exploration using Ukrainian assets, and has called for further cooperation in the oil and gas sectors.

However, cooperation with Libya appears to be even more promising. On October 10, 2004, Naftogas Ukrayny and Libya's National Oil Corporation signed a production sharing agreement. Under this document, Naftogas Ukrayny would take part in the development of four oil and gas fields in Libya, covering 200 thousand square kilometers with estimated reserves of 110 million tons of oil and 30 billion cubic meters of gas. Naftogas had committed to invest about $58 million in this project. However, the Libyan government did not ratify the agreement. New rules were applied for the fields' exploration and now 44 lots will be offered for open international tender. In April 2005, a Ukrainian delegation visited Tripoli and discussed further Ukraine-Libya cooperation in the energy sector, with successful results. Both countries agreed to cooperate in oil and gas exploration, and Ukraine will take part in international tender as a reliable partner in Eastern Europe. The parties have also discussed the possibility of Libyan crude oil supply to Ukraine by tankers via the Turkish straights of Bosporus and Dardanelles.

4. Internal Exploration[24]

One of the priorities in developing the Ukrainian energy sector is further exploration of internal oil and gas reserves. Although Ukrainian oil and gas resources are not competitive to those of the Caspian Sea region, exploration and efficient use might decrease dependence on Russian energy recourses.

[24] Data presented in this section is derived from the official website of Ukrainian State Company "Naftogas Ukrayny".

According to geological data, the Ukrainian Black Sea shelves carry 1.5 billion tons of conventional fuel in the form of gas and oil. Unfortunately, only 3 percent of full capacity has been explored. Naftogas Ukrainy has planned oil and gas development in the shelves of Black Sea and the Sea of Azov through 2015. The leading exploration company in this region is Chornomornaftogas, which has five active oil and gas fields on the sea shelves and is scheduled to begin exploration of another four fields over the next three years. However, even successful exploration and development of those additional fields will not increase the average Ukrainian oil and gas production levels, because new reserves will just replace the old fields that are now in the last phases of exploitation. To increase gas and oil production significantly, the Ukraine needs large, long-term financial investments. As the controlling interest in Naftogas Ukrainy belongs to the government, and the Ukraine does not have sufficient financial capacity to make such investments, this problem will probably persist. Partial privatization of exploration assets would probably help solve the problem, however, with the potential of the Caspian Sea region, it is hard to find any party interested in Ukrainian projects other then Russia. Again, privatization of Ukrainian exploration would only deepen Russia's monopoly on the energy supply to Ukraine. Therefore, further exploration of internal Ukrainian reserves is a limited option for now. Nevertheless, existing recourses should be considered as future strategic means for Ukrainian energy systems.

5. Nuclear Fuel[25]

Although electricity production in Ukraine exceeds internal demand, a diversification in nuclear fuel supply is needed due to the Russian monopoly in this sector. After the break-up of the Soviet Union, the Ukraine negotiated to repatriate nuclear warheads and missiles to Russia in return for nuclear fuel supplies. After that, Russia became the sole supplier of nuclear fuel and nuclear cycle services. Currently, the Russian Corporation TVEL supplies all the fuel used by all fifteen Ukrainian reactors.

Although Ukraine's dependence on Russian fuel rods and nuclear after-processing have not been exploited so far, it is quite possible in the future. The Ukraine's national security interests indicate the necessity of diversification. As the Ukraine tries to

[25] Numeric data presented in this section is derived from official website of Ministry of fuel and energy of Ukraine.

minimize Russian economic influence, it should consider all possible means for such influence, as nuclear power plants produce nearly 50 percent of Ukrainian electricity, and it would be highly advantageous for Russia to control it.

The Ukraine considers the U.S. as an alternative nuclear fuel supplier. In 2003, the joint Ukraine-U.S. project was started, for adapting American nuclear fuel for use in Ukrainian Atomic-Electro-Stations (Ukrainian title for nuclear power plant). In October 2004, representatives from Westinghouse completed installation of the nuclear assemblies monitoring system in the Pivdennoukrainska power plant. In the summer of 2005, this station will begin experimental use of six Westinghouse-made nuclear cartridges. If testing is successful, a future agreement will be reached on a supply of 160 more fuel rods from the U.S.

Additionally, Ukraine remains dependent on Russia for reprocessing spent nuclear fuel. Until 1998, all spent nuclear fuel from Ukraine's reactors was sent to special storage facilities in the Krasnoyarsk and Mayak plants for reprocessing. In 1998, there was an instance when the Russian reprocessing plant in Krasnoyarsk city refused to take, for reprocessing, 40 tons of spent fuel from the Ukrainian Zaporozhska nuclear power plant. The claim was that the price of reprocessing was too low. Since then, the price has increased from $285 to $330 per kilogram. In 1998-1999, shipments of spent nuclear fuel to Russia cost Ukraine around $100 million a year. After 1998, Ukraine started storing spent nuclear fuel on Ukrainian territory instead of reprocessing it in Russia. According to the Ukrainian Fuel and Energy Ministry, dry storage in Ukraine is 10 times cheaper than sending it to Russia. The first Ukrainian dry storage facility was put in operation near the Zaporozhye power plant in September 2001, with a total of 380 containers having service lives of 50 years. Each container can be loaded with 22 spent fuel assemblies and weighs over 20 tons.

In 2004, the Ukraine announced a tender for the design and construction of spent nuclear fuel storage facilities with participation from six firms: Framatome ANP (France), Atomstroyexport (Russia), Holtec consortium (U.S.), BNFL (UK), consortium of JNS (Germany), and Novokramatorsk machine-building plant (Ukraine). Holtec won that competition and will start construction in 2005 with an expected completion date in

2008. The capacity of the project's first stage will be 3,580 spent fuel assemblies from various reactor types. It is estimated that the facility will receive 720 assemblies annually. Successful completion of theses projects would improve the Ukrainian position relative to Russian nuclear fuel and its reprocessing capacity.

C. SUMMARY

In conclusion, for this chapter, the three major alternatives for Ukrainian energy market development will be reviewed and the most appropriate solution for Ukraine will be surmised. As mentioned earlier, the three major alternatives are: continuation of oil, gas, and nuclear fuel imports from Russia; further exploration of own natural reserves; and diversification of suppliers.

Continuation of oil, gas, and nuclear fuel imports from only Russia is not an appropriate option for Ukraine. From an economic perspective, this option has two aspects. One is that further involvement of Russian energy companies in the Ukrainian market would help Ukraine develop its energy infrastructure and bring in financial investments needed for reforming. The second aspect is that Russia will have even stronger economic control over the Ukrainian energy market, such as full price control and quantitative regulation. Politically, this option is not an acceptable one for Ukraine either. The reason for that is the use of economic advantage by Russia in bilateral political relationships. During the last decade, Russia has used economic leverages to apply political pressure to Ukraine several times. Now the possibility of an attempt to influence Ukraine is increased, because Russia does not share the political position of the new Ukrainian government.

Further exploration of internal natural reserves would be a good option if Ukraine had the financial capabilities or adequate foreign investors. However, in opening up the energy market, Ukraine risks greater monopolization, as the most interested investors for Ukraine's energy are Russian companies. This would only strengthen Ukrainian dependence on Russian energy sources. So, for national economic security reasons, Ukraine should assure that foreign investments are attracted not only from Russia. Due to the Caspian Sea potential and unstable security for foreign businesses in Ukraine, this is hard to accomplish. That is why the exploration of internal Ukrainian reserves is a limited

option for now. However, Ukraine should consider existing recourses as a future strategy for energy systems development, and ought to begin to find efficient ways to explore it.

The diversification of energy suppliers is the most acceptable option for Ukraine. Only this would eliminate the Russian monopoly on supply and decrease its economic influence. Ukraine should consider two major alternatives on oil and gas supplies: Caspian Sea region countries and OPEC countries. As Ukraine has a good potential capacity of energy transit from Asia to Europe, it has to use the advantage of this. The diversification of nuclear fuel supply requires further development of cooperation with countries of nuclear power.

Finding alternatives for oil, gas, and nuclear fuel supplies does not necessarily mean that the Ukraine should aspire to stop importation of Russian energy supplies, as that is impossible, since Russia has the largest natural reserves in the region. However, the main goal of such diversification is the development of a flexible energy supply system, which in turn would eliminate the Russian monopoly and economic influence.

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VI. REFORMATION OF UKRAINIAN ENERGY HIERARCHY

Reformation of the Ukrainian energy industry is an important part of energy market development in Ukraine. Several steps can be taken to reform the energy sector: restructuring and efficiency improvement, reducing corruption, and attracting Western investors.

In the oil and gas sector structure, it can be seen that the industry is highly concentrated. Ukraine's largest energy company is the state oil and gas holding company, Naftogas Ukrainy. The significance of that company for the Ukrainian economy is indicated by its accounting for 19 percent of government revenue and 15 percent of GDP. Naftogas Ukrainy is at the top of a variegated pyramid of sub-companies and subcontractors presented in Figure 1. Through its subsidiaries, ChornomorNaftogas, Ukrtransnafta and Ukrtransgas, it controls the oil and gas pipeline network. Ukrtransnafta in turn has further subsidiaries, pipeline operations companies named Pridniprovsky and Druzba. Other subsidiaries of Naftogas Ukrainy, Ukrnafta and Ukrgasextract, are oil and gas exploration companies that develop offshore fields in the Black Sea and the Sea of Azov. Uknafta itself also has a highly developed infrastructure. It is responsible for 93 percent of the country's oil production, 40 percent of its gas condensate, and 18 percent of its natural gas. It controls 100 oil and gas fields in the Carpathian, Donetsk, and Dnipro regions, and also owns three gas processing plants and a network of filling stations. In total, Naftogas Ukrainy has twenty direct and mediated subsidiaries.

The inefficient and centralized organization of the industry facilitates state-connected corruption. President Kuchma's government initiated the formation of the vertically integrated oil company, on the basis of the state's shares in oil-producing and oil-refining firms. Initially, the company was to be organized on the basis of the assets of Ukrnafta. However, after the urging of the chairman of Naftogas Ukrainy Y.Boyko (a very influential person who has business and political connections), the final decision was to consolidate everything under Naftogas Ukrainy.

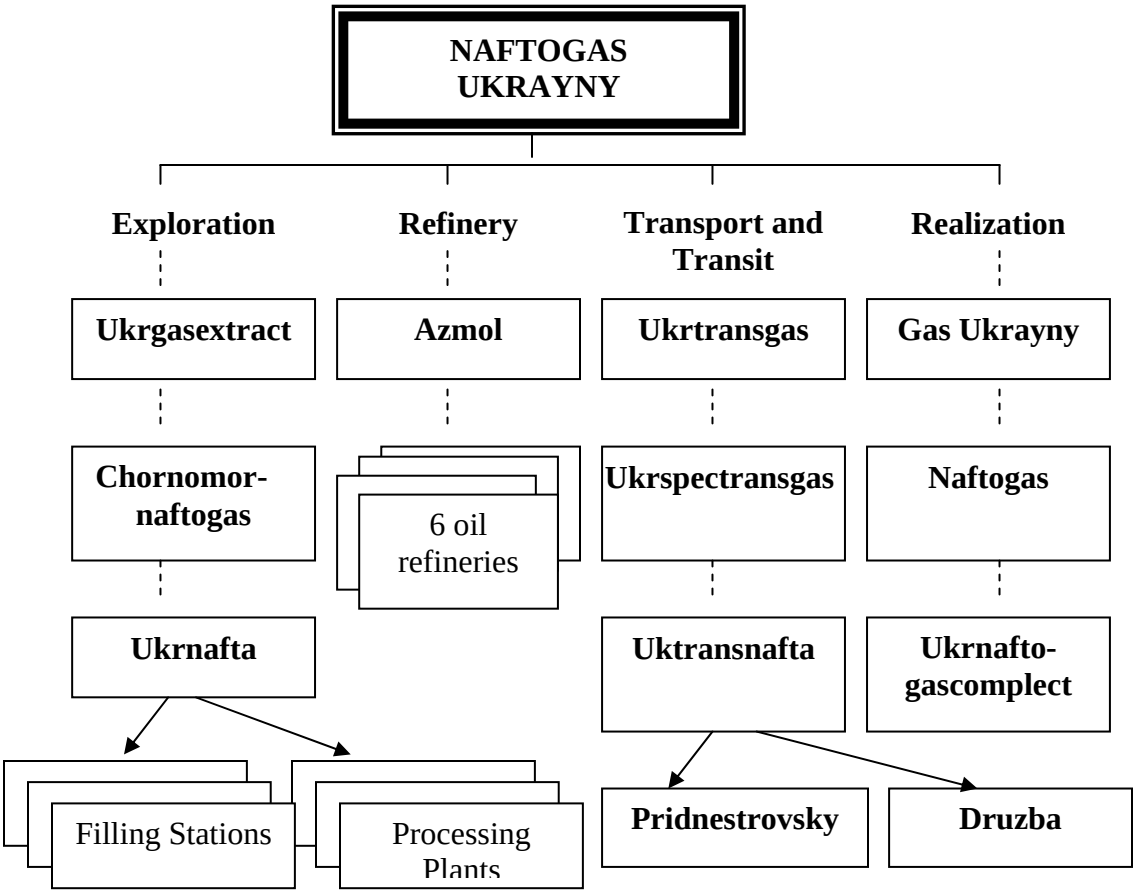

Figure 1. Organizational structure of Naftogas Ukrayny[26]

Thus, restructuring of the Ukraine's gas and oil monopoly and the selective replacement of existing management are the most effective ways to improve efficiency and reduce corruption in the energy industry. The first step in this process was the replacement of Y.Boyko in March 2005. Also, over the last several years, the Yushchenko government has begun re-analysis of privatization initiatives. There are also several investigations going on in regards to the legitimacy of sales, when government members or their relatives privatized state assets at understated costs. These include privatizations or resale of oil refineries to Russia-related owners.

Special attention should also be devoted to the so-called Private Group, a group of businessmen supported by Private-Bank assets, formed in 1992. It holds 42 percent of Ukrnafta shares, and is the sole owner of one refinery and is partnered with Russian

[26] Derived and translated from "Naftogas Ukrayny" website.

companies to control two more refineries. Private Group's corporate structure is not clear, as it has shares also in metallurgy and banking, and uses a number of offshore subsidiaries as ownership members. During the Kuchma regime, the Private Group was believed to have government backing. Thus, Ukrnafta was practically controlled by Private-Bank, even though 50 percent plus 1 share belongs to state. However, the group's leadership was flexible enough to remain out of the political struggle during the Orange Revolution. The only completed action is a supply of winter shoes for strikers in Kiev, which can now be counted as a political asset for the Private Group. Nevertheless, with new government policy, Private Group might be in conflict with the Yushchenko administration.

Restructuring and reformation is also urgently needed for the coal industry of Ukraine. State coal reserves are more than enough to satisfy internal demand, but production levels are low. The main reason is high inefficiency of more than half of the operating coalmines. The industry survives only with the help of heavy government subsidies. However, even those subsidies are not enough for industry development. About one third of all mines in Ukraine have outdated equipment, a lack of spare parts, and poor safety procedures. Most mines belong to state-owned coal enterprises, and are run by managers appointed by the Ministry of Fuel and Energy. During the Kuchma administration, people who were connected to the so-called "Donetsk business clan", an informal group of business and political leaders reputed to be highly corrupted, headed these institutions. The Ukrainian Coal Ministry was described in a December 1998 World Bank report as follows: "Arranging barter trades and bombarding the Finance Ministry and cabinet with requests for additional investment funds and production subsidies became the main occupation of the Coal Ministry."[27]

Partial privatization of the coal industry did not lead to positive results, as the government was willing to sell only unprofitable mines with little potential. Thus, a possible solution for the problem would be to close all non-productive mines and use the released resources in profitable or promising mines, re-equipping and modernizing them in order to increase production. However, such a solution creates more problems, as

[27] World Bank report "Restructuring the Coal Industry in Ukraine" December 1998.

closing mines are highly expensive and a hundred thousand people would be left unemployed in areas without job opportunities.

As can be seen, the reformation of the Ukrainian energy systems structure is an important part of the development of the internal energy market. It is one of the biggest challenges of the new Ukrainian government. A consistent internal policy towards energy systems is a key aspect in the process of improving efficiency, reducing corruption and attracting Western investors. The success in these processes will play a critical importance in achievement of Ukrainian's goal of economic independence.

VII. THE U.S. ROLE

The interests of the United States in Ukraine have several deeply intertwined aspects. Almost every issue in which the U.S. has interests in this part of the world is connected to Ukraine: expansion of the political influence in countries of the former Soviet Union with containment of Russian influence, interest in the energy resources of the Caspian Sea region, and Iran isolation.

Due to its geographical location, the Ukraine is in a very important strategic position. The interplay of U.S., Russian and Ukrainian interests has been one of the most complicated and delicate policy concerns for the region. On the one hand, the Ukraine is key to the Russian policy of keeping its neighbors close. On the other hand, the U.S. is interested in the Ukraine's Euro-Atlantic integration, which would weaken the Russian position in the region. Thus, the Ukraine is not only a "buffer zone" between European countries and Russia, but also between U.S. and Russian interests in the region. The U.S. vision of the Ukraine as a politically independent state free of Russian influence is not consistent with tight economic ties between Russia and the Ukraine. The Ukraine, in turn, understands the importance of maintaining good relations with both Russia and the U.S. The Ukraine is interested in developing relationships with the EU, WTO, and NATO, but it also realizes the importance of its complex relationship with Russia. This compels Ukraine to avoid permanently taking any side. The best solution for the U.S. would be full Ukrainian economic independence. This coincides with Ukrainian's economic policy towards Russia. Thus, the U.S. might be very supportive of Ukrainian projects for energy supply diversification.

Coincidently, the U.S. support for the Ukrainian desire to become a transit corridor for Caspian oil and gas also responds to another political issue, Iran. One of the possible alternative routes for Caspian energy sources lies through Iran. However, Washington opposes Iranian involvement in the Caspian. Thus, as it was concluded earlier, the most advantageous route for energy transit is through the Ukraine.

Although U.S. support for Ukrainian energy projects would respond to both the U.S. and Ukraine's interests, it is still a very sensitive issue. The new Ukrainian

government is regarded as pro-Western and has started to actively promote cooperation with the EU, the U.S and NATO. However, active courting of Western involvement might anger Russia and escalate the situation. So, if the U.S. hastens to side with the Ukraine now, it might be involved in an unwanted confrontation with Russia. A more unfortunate option would be involvement in a confrontation should the Ukraine promise to join NATO. On the other hand, if the U.S. and the West leave the Ukraine on its own, the Ukraine may not withstand Russian pressure, and fall under its economical and political control again. A similar situation occurred in 1992-1993. At that time, the newly independent countries were deciding which way to choose for future development. There were two general possibilities. The first was union on an economic basis, since the elements of the Soviet economic system were highly interrelated and relatively isolated from other countries. The second was deeper political and economic division. Unlike other countries of former Soviet Union, the Ukraine was more amenable to the second variant, because there was a massive wave of active anti-communist and anti-Soviet sentiments.

Those movements took the shape of an anti-Russian dominance on post-Soviet territory. Many in the new government were Ukraine nationalists from the western parts of the country. At that time, western influence could play a very important role. However, U.S. policy towards Ukraine (and other former Soviet Republics) at was not proactive. The U.S. and the West generally took the “wait-and-see” position and did not risk interference. Russian economic and political dominance was soon reasserted, supporters of a pro-Russian direction came to power, and the turning point passed. If the West had undertaken more efforts to gear Ukrainian foreign policy towards the West, it would have quite possibly significantly changed the current alignment of nations.

Today, the U.S. might adopt a more flexible policy toward Ukraine, supporting economic sovereignty and energy projects but holding off full political and military backing. First results would indicate further developments, as the U.S. might draw the appropriate conclusions and rebuild its policy accordingly. Now is a very good time for such tactics, because today, Ukraine has the most reform-minded government it has ever had. The U.S. should take advantage of the occasion.

VIII. WHILE THIS THESIS WAS IN PROGRESS

While this thesis was written, some connected developments occurred. Some of them changed the situation of the Ukrainian energy systems, and some just reinforced already existing conditions.

The Ukrainian government announced regulations on petroleum product prices, specifically on diesel fuel and gasoline.[28] This decision followed the sudden price increase by several distributing companies simultaneously. At first, the State Antimonopoly Committee requested substantiation for this price change and also called those firms to produce evidence of competition among them. After several companies failed to explain their price formation policies, the Antimonopoly Committee launched several investigations against the following companies: "Linos" (Russian capital), TNK-BP Ukraine (Russia-Britain), Lukoil Ukraine (Ukraine-Russia), Litasko Ukraine, and Lukoil-Odessa (Ukrainian–Russian capital). All of those companies distribute or process oil imported from Russia. In the case of a proven price fixing agreement among the petroleum products distributors, they will each be fined up to 10 percent of their 2004 revenue. The Minister of Economy stated that the government and he personally do not support an administrative style in controlling the economy. However, the situation is such that a few foreign distributors control the Ukrainian oil distribution market. In this case, a regulatory regime is the only possible defense of Ukrainian national interests.

At the end of April 2005, Turkey refused to provide Bosporus and Dardanelle Strait access to oil tankers from Libya to the Ukraine.[29] The official reason for the refusal was concern about environmental conditions in the straits. Turkey tries to minimize traffic through its channels, especially oil tankers, due to the immediate vicinity of several Turkish large cities and a high risk of oil spills. This decision lessens Ukrainian efforts to minimize its dependence on Russian oil using oil supplies from OPEC countries. Thus, using pipeline Odessa-Brody with oil from the Caspian Sea region became of critical importance. Turkey was against "reverse" use of Odessa-Brody

[28] *Korrespondent.* 22 April 2005.

[29] *Korrespondent.* 23 April 2005.

because it also increased tanker traffic through its straits. Turkey demonstrates an understandable and consistent position on this issue. However, the Ukraine should not lose hope of future use of the Bosporus and Dardanelle Straits for oil supply when it stops using the Odessa-Brody pipeline in reverse mode.

German Deutsche Bank opened the first credit of $300 million under the previous agreement of providing a credit line of 2 billion euros for the Naftogas Ukrayny national company.[30] This credit was granted directly to the company (without governmental backing) for modernization of oil and gas transportation systems, geological exploration and other projects. The Chairman of Naftogas Ukrayny stated that money might also be used for construction of the Odessa-Brody-Plotsk project.

[30] *Firstnews.* 21 April 2005

IX. CONCLUSION AND PROPOSITIONS

The Ukraine's energy system remains under Russian economic influence to a certain extent. This influence is mostly realized through Russian domination of oil, gas and nuclear fuel supply to Ukraine. Although Russia is not capable of strong and immediate dictation of economic terms for Ukraine's development, it is still able to effectively use its economic advantage over Ukraine. Recent political developments in the Ukraine (including the Orange Revolution and election of a new pro-Western President) are not supported by Russia and do not match Russian policy towards the Ukraine. Thus, further attempts by Russia to change the political situation in Ukraine by means of economic pressure are still possible. In order to get free of Russia economic influence, the Ukraine should find and develop alternatives for its oil, gas and nuclear fuel supplies. Successful diversification includes the following measures: reforming and restructuring of oil, gas and coal industries, dealing with energy business clans formed on the basis of combination of state power and private capital, quickly competing the Odessa-Brody oil pipeline, and bringing in foreign investment.

It is highly recommended that the Ukrainian government take quick steps in reforming the oil and gas industry structure in order to improve efficiency, reduce corruption and attract Western investments. One effective tool for such reformation would be privatization of some energy sector assets. However, this should be done very carefully because there are two negative developments possible. One is further concentration in the sector. To prevent that, the Ukrainian government should identify a list of companies for privatization. For national security reasons, some firms must remain under state control, such as Ukrtransnafta or Ukspectransgas, who control oil and gas pipelines. Companies like Ukrnafta or Chornomornaftogas can be privatized without serious concern of reducing competition. Another problem is that Russian oil and gas companies are still the most interested parties in privatization of Ukrainian assets. If not controlled, privatization might also deepen the economic dependence of Ukraine on Russia.

The same solution could be applied to the coal industry. Partial privatization is key to increasing coal production. However, the process of privatization should be planned effectively. For example, the Ukrainian government should stop its practice of offering only unprofitable mines for privatization. Nobody wants to buy them, and they would not bring in much revenue if sold. Instead, it might want to sell some profitable mines, which will bring more funds for closing or modernization of other industry assets. The unemployment problem, a result of necessary closings, would be partly solved as well if the terms of privatization would stipulate an increasing number of jobs.

Restructuring and reforming the energy systems also depend on the degree of integration of business and politics. Although lobbying and other forms of interrelations between capital and policy have certain rationale, the Ukrainian government must be concerned about possible corruption. The development of relationships with such large corporations such as the Private Group would be a sign of the government ability's to carry out its reform agenda. Controlling nearly 50 percent of the country's oil refinery capacity and 42 percent of its oil exploration, this group still maintains political influence, especially in its regional base at Dnipropetrovsk, which in turn is the most related to Russia. Relations with this corporation should be founded in state authority and national interests. At the same time, it needs to be done very flexibly in order to avoid promoting a command economy style.

There is a strong chance that Ukraine can join the World Trade Organization by the end of 2005, if it is able to succeed in making reforms. To achieve this, Yushchenko's cabinet should take necessary actions as soon as possible, because the parliamentary elections future political reform expected in 2006 might slow down the reform processes, if the opposition party of V. Yanukovych is successful in those elections.

Since the Odessa-Brody pipeline is the most significant factor in Ukraine's aspirations to diversify oil supply, the government should intensify its construction efforts for connecting to Polish infrastructure. This is the most important and most feasible measure for the Ukraine in the near future. Immediately after completing the pipeline, it should be used in its initially planned direction. In order to provide oil supply for pipeline exploitation, the Ukraine should begin negotiations with oil suppliers before

the pipeline is finished. The Ukrainian government has to reach a final agreement with Georgia for using its territory and Black Sea ports for transit, and also with Turkmenistan for its oil supply. Although Azerbaijan initially refused to participate in the project, Ukraine should not abandon efforts to make it another oil supplier.

A quick completion of the Odessa-Brody pipeline opens a possibility to resume negotiations with Turkey about using the Bosporus and Dardanelle Straits. Reverse direction of the pipeline increased tanker traffic by 4 percent. If that is stopped, oil transported through the channels will decrease by 90 thousand barrels per day, and Ukraine might then have a chance to use this released capacity for importing oil. This would allow the renewal of talks about Libyan oil supply for the Ukraine. Thus, the importance of completing the Odessa-Brody pipeline has grown even more, because doing so will two new oil channels, and finding new sources of oil is exactly what the Ukraine needs.

Further diversification of energy suppliers could be achieved by accelerated implementation of other oil and gas projects with OPEC countries. One of the main goals for the Ukrainian government should be acceleration of the projected construction of the Iran-Ukraine-Europe gas pipeline. This will not only help the Ukraine obtain economic independence, but will develop further cooperation with Western European countries. It is also recommended to advance the Ukraine's participation in the exploration of Libyan oil and gas fields. At the same time, Ukraine should be very careful in developing relationships with the countries of Libya and Iran, as those states are subject to sanctions and embargoes.

Since almost all reforms of Ukrainian energy systems, such as restructuring of the coal, oil and gas industries, require large investments, one of the critical goals might be to bring in foreign investments. In order to do this, the Ukraine should create favorable conditions for investors, including freedom of capital movement, security for foreign businesses, and an appropriate taxation policy. Russian capital is already prepared to intervene (and already has) in Ukrainian energy industries while Western businesses are still very cautious. The Ukraine might want to secure simultaneous participation of Russian and Western capital in order to ensure competition and appropriate privatization.

Therefore, each case of privatization or sale to foreign capital formations should be analyzed accordingly. For example, if a preliminary list of potential investors for a particular project consists of only Russian firms or if they are the majority, research must be done in order to investigate the causes for this, and then regulations should be changed correspondingly.

Simultaneous and complex implementation of proposed measures would help Ukraine decrease its dependence on Russian energy sources. This will allow Ukraine to obtain not only economic independence, but will also decrease Russian political influence on Ukraine's self-determination.

APPENDIX

This appendix describes the modern theory of oil origins developed by Ukrainian and Russian scientists starting from 1950's, which is different from traditional concepts. This modern theory would, if proven significantly change the world energy market.

The traditional concept of crude oil origin assumes that petroleum somehow evolved from biological remains (detritus). For almost three hundred years, this hypothesis was the generally accepted explanation of how oil forms. As far back as 1757, the Russian academician Michailo Lomonosov presented the biogenic theory of oil: "Rock oil originates as tiny bodies of animals buried in the sediments which, under the influence of increased temperature and pressure acting during an unimaginably long period of time, transform into rock oil." (Slovo o roshdenii metallov ot tryaseniya zemli, Proceedings of the Imperial Academy of Sciences, St. Petersburg, 1757). Since then, the bionic nature of oil became conventional wisdom for geological science.

The first enunciation of an alternative hypothesis was made by the Soviet scientist N. Kudryavtsev in 1951[31]. This new hypothesis assumes that petroleum is an abiotic, primordial material, which has been erupted from great depth to the crust of the Earth. During its first decade, new theory was controversial. Then, with its deeper development by Russian and Ukrainian scientists, the modern theory of deep, abiotic petroleum origins has become a respectable theory. This is how the Soviet professor Emmanuil B. Chekaliuk presented this theory at All-Union Conference on Petroleum and Petroleum Geology, Moscow, 1968:

> Statistical thermodynamic analysis has established clearly that hydrocarbon molecules which comprise petroleum require very high pressures for their spontaneous formation, comparable to the pressures required for the same of diamond. In that sense, hydrocarbon molecules are the high-pressure polymorphs of the reduced carbon system as is diamond of elemental carbon. Any notion which might suggest that hydrocarbon molecules spontaneously evolve in the regimes of temperature and pressure characterized by the near-surface of the Earth, which are the regimes of methane creation and hydrocarbon destruction, does not even deserve consideration.

[31] Kenney, J. F. *Energy World*, British Institute of Petroleum, London, June 1996.

Today, the modern Russian-Ukrainian study of abiotic oil origin is an extensive body of scientific knowledge that covers the chemical genesis of the hydrocarbon molecules which comprise natural petroleum, the physical processes which occasion their terrestrial concentration, the dynamic processes of the movement of the materials into geological reservoirs of petroleum, and the location and economic production of petroleum. In Ukraine, such institutions should be credited for the research and development of the abyssal, abiotic oil theory as Kiev Institute of Geological Sciences and Lviv Institute of Geology and Geochemistry of Combustible Minerals, Ukrainian National Academy of Sciences; Ukrainian Geophysical institute (Ukrgeophysica). The recent works are done by Ukrainian scientists I.Chebanenko, V.Klochko, A.Krayushkin, and E.Dvoryanin. In 1997 they were awarded the State Prize of Ukraine in the field of Science and Technology for successful oil exploration in Dnepro-Donets Basin[32]. Unfortunately, there is not much information can be found about present stage of development or applying of abiotic oil study as universally accepted theory to practical oil exploration.

The main implication for economic affairs is that oil is not a fossil fuel and does not exists only in fixed, limited quantity in sediments of the Earth crust, but is available in larger quantities in deeper layers. This implies that petroleum availability depends mainly upon technological development and exploration competence[33].

In particular for the Ukraine, the modern theory of abiotic oil origins can play a significant role in oil exploration. According to the theory, there is a very high chance that much petroleum exists and will surely be produced from reservoirs underneath those presently being exploited. Thus, either the older oil fields would not be depleted soon, or deeper reservoirs could be explored and exploited. This may affect to both types of Ukrainian oil reserves - continental and sea shelves. If it is true, oil production in Ukraine will increase with exploration of Azov Sea shelves, instead of being constant as it is explained in Chapter V. Also, with the development of deep drilling technologies, Ukraine may become self-sufficient in oil. If this prospect materializes, then Ukraine's

[32] Kenney, J. F. *Energy World*, British Institute of Petroleum, London, June 1996.

[33]Gas Resources Corporation.

economic dependence on Russian oil will disappear as well as Russian influence on the Ukrainian future.

However, even the practical confirmation of deep oil reservoirs existence will not solve Ukrainian problem immediately. At first, further research and development of the modern abiotic oil theory will demand from Ukraine certain acceleration of current scientific research. Then, Ukraine would need to advance in technology for deep drilling and deep extraction. All these still require large amount of financial investments, and thus, revert Ukraine to the earlier mentioned problems.

Nevertheless, one should consider the conclusions and perspectives opened by modern theory of abyssal abiotic petroleum origins when researching the problems of oil provision.

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